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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,628	05/09/2005	Peter Hegemann	231181	4179
23460 7590 12/19/2007 LEYDIG VOIT & MAYER, LTD TWO PRUDENTIAL PLAZA, SUITE 4900 180 NORTH STETSON AVENUE CHICAGO, IL 60601-6731				
			EXAMINER MACFARLANE, STACEY NEE	
			ART UNIT 1649	PAPER NUMBER
			MAIL DATE 12/19/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,628	Applicant(s) HEGEMANN ET AL.	
	Examiner Stacey MacFarlane	Art Unit 1649	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/01/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 6, 7 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12 and 19-31 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/09/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 1-15 and 19-31) and the CHOP-1 species of protein in the reply filed on November 1, 2007 is acknowledged.

The traversal is on the ground(s) that the inventions of Groups I-V form a single general inventive concept. This is not found persuasive because Pursuant to 37 C.F.R. § 1.475

(a), Unity of invention before the International Searching Authority, where a group of inventions is claimed in an application, unity of invention exists if the claims are drawn only to one of the following combinations of categories:

- (1) A product and a process specially adapted for the manufacture of said product; or
- (2) A product and process of use of said product; or
- (3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or
- (4) A process and an apparatus or means specifically designed for carrying out the said process; or
- (5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

2. The inventions of Groups I-V are drawn to methods of use of structurally distinct biological photoreceptors (algal, archaean, protozoan, bacterial or fungal) as a light-controlled ion channel for the alteration of the ion conductivity of a membrane with the aid of light, wherein the photoreceptor comprises an apoprotein and a light-sensitive polyene covalently bound to the apoprotein, and wherein the polyene interacts with the apoprotein and functions as a light-sensitive gate. Proteins that differ by a single amino acid are materially distinct structures capable of mediating distinct cellular functions.

Since they are not interchangeable or substitutable in structure, function or effect, there is nothing of record to show algal versus bacterial photoreceptors to be obvious variants of one another and they do not encompass overlapping subject matter. Taken together, these inventions are patentably different categories that do not fall into one of the combinations that the ISA/US considers as supporting unity of invention.

The requirement is still deemed proper and is therefore made FINAL.

3. Claims 6-7, 13-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on November 1, 2007.

4. In so far as they read upon an algal biological photoreceptor and the instantly-elected species of CHOP-1 protein, claims 1-5, 8-12 and 19-31 will be considered upon their merits in the instant office action.

Sequence Compliance

5. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. § 1.821 (a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 C.F.R. § 1.821 through 1.825. Specifically, no sequence identification has been provided for the amino acid sequences presented in Figures 1A, 1B, 1C and 1E and Claim 8 of the instant specification. In case this sequence is new, Applicant needs to provide a substitute computer readable form (CRF) copy of a "Sequence Listing" which

includes all of the sequences that are present in the instant application and encompassed by these rules, a substitute paper copy of that "Sequence Listing", an amendment directing the entry of that paper copy into the specification, and a statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. § 1.821 (e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d). The instant specification will also need to be amended so that it complies with 37 C.F.R. § 1.821(d) which requires a reference to a particular sequence identifier (SEQ ID NO:) be made in the specification and claims wherever a reference is made to that sequence. See M.P.E.P. 2422.04.

Claim Objections

6. Claim 12 are not in compliance with the requirements for Sequence Identifiers (see MPEP 2422.03). The appropriate format for sequence identifiers is SEQ ID NO: X, wherein "X" is a sequence number. Currently claim recites SEQ ID NO:AF385748. Appropriate correction is required.

Specification

7. The disclosure is objected to under 37 CFR 1.71, as being so incomprehensible as to preclude a reasonable search of the prior art by the examiner. For example, the following items are not understood: Applicant has elected to prosecute claims drawn to an algal biological photoreceptor. Page 7 of the instant specification states, "According

to the invention, two different proteins of known sequence were functionally expressed from *Chlamydomonas reinhardtii* and for the first time identified as passive ion transport systems. These are Channelopsin1 (= CHOP-1; also called Chlamyopsin-3 = COP3) and Channelopsin2 (= CHOP-2; also called Chlamyopsin-4=COP4)". Claim 12 specifically reads upon "Channelopsin1 (CHOP-1) according to SEQ ID NO:AF385748". There is no reference to the sequence identifier "AF385748" anywhere within the Sequence Listing. The only other reference to "AF385748" of the claim is in the Description of Diagrams, which states that Figure 1A is the "Amino acid sequence of Channelopsin1 (CHOP-1) SEQ ID NO: AF385748". The Sequence Listing, however, further confounds the issue by identifying "The amino acid sequence of CHOP-1" as AF461397 (see field <223> of SEQ ID NO: 1). Accordingly, a search of the claimed subject matter "SEQ ID NO:AF385748" is incomprehensible and the specification seems to only further confound the issue as to which sequence relates to the instantly-elected CHOP-1.

Applicant is required to submit an amendment which clarifies the disclosure so that the examiner may make a proper comparison of the invention with the prior art.

Applicant should be careful not to introduce any new matter into the disclosure (i.e., matter which is not supported by the disclosure as originally filed).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-5, 8-12 and 19-31 provide for the use of a biological photoreceptor, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 1-5, 8-12 and 19-31 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Discussion of Closest Relevant Art

10. The following prior art made of record, and not relied upon for rejection, is considered pertinent to applicant's disclosure: Lang et al. US Patent 4,879,284 issued November 1989; Ohyama et al. US Patent 5,041,224 issued August 1991; Miesenböck et al. US Patent 7,144,733, issued December 2006; Nagel et al. (2002) reference "AD" on the IDS filed November 2, 2004.

Conclusion

11. No claim is allowed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stacey MacFarlane whose telephone number is (571) 270-3057. The examiner can normally be reached on M,W and ALT. F 6 am to 3 pm, T & R 5:30 am - 4 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Stucker can be reached on (571) 272-0911. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stacey MacFarlane
Examiner
Art Unit 1649

/SNM/


OLGA N. CHERNYSHEV, PH.D.
PRIMARY EXAMINER